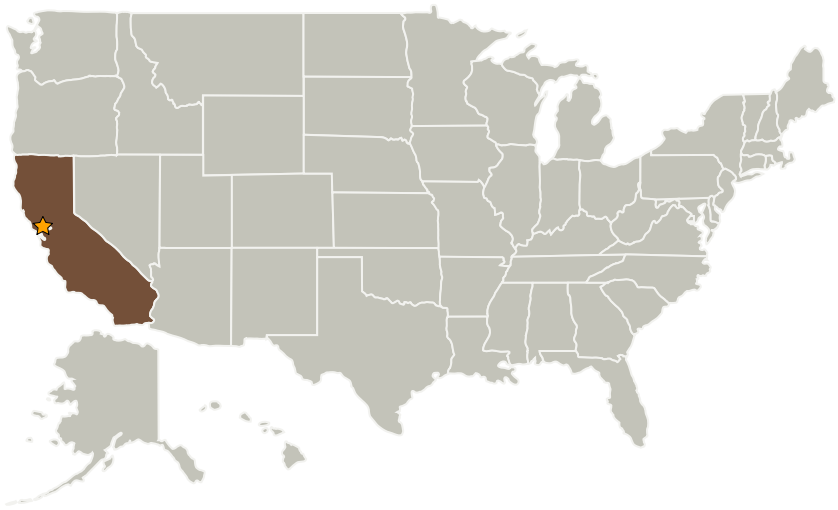
Carbon Nanotube Electron Sources for Air Purification, Phase II

Completed Technology Project (2006 - 2008)

Project Introduction

The innovation proposed here focuses on cleansing air with high energy electrons. Bombardment by electrons has proven to be effective in removing a wide spectrum of chemical and biological pollutants. Electron beam systems have a significant advantage over conventional VOC and odor control technologies. The process requires less energy than other purification methods, generates no additional CO2, requires no additional reagents and does not produce any solid or hazardous waste. We propose to develop an e-beam source to meet the restrictive cost, weight and reliability requirements attendant to commercial passenger aircraft and manned space exploration. The key to this transition is to replace the thermionic cathode electron emitter with a carbon nanotube (CNT) field emission cathode. During Phase 1 we completed a design of an e-beam system suitable for maintaining air purity for an enclosed four men space station. The system is compact, light weight and will fit readily in line with an air conditioning duct. In Phase II, we will detail the design, and build a prototype of the e-beam system. That e-beam source can also be use for decontaminating small widely distributed pollution sources, such as small paint shops, gas stations, and restaurants.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
inXitu, Inc.	Supporting Organization	Industry	Mountain View, California

Primary U.S. Work Locations
California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.4 Engineering and Integrity
    - TX10.4.2 Test and Evaluation of Autonomous Systems